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SPECIAL ISSUE − Applied GIS in the context of smart regions and cities
EDITORIAL

GEOSCAPE

Applied GIS in the context of smart regions and cities

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Smart technologies change the world around us. The vision of smart cities and smart regions are incorporated into various projects and initiatives. Geoinformation technologies (GIT) play an important role in the design and development of such cities and regions especially in management of cities and regions, their construction, and transport or environment protection. We can meet smart buildings and technological complexes, smart solutions for technical infrastructures, transportation management, sensor networks for various needs from environmental monitoring to household controls and health applications, design and utilization of digital models of cities and regions for e.g. simulations of urban studies or new projects in emergency planning. The connection between smart cities and geoinformation technologies does not represent one-way flow where GIT supports smart applications. Improved utilization of information and communication technologies brings new data, new services or substantial increasing of their level. Big Data, Sensor networks, Building Information Modelling (BIM), or new economic models of services represent new challenges for the GIT development.

This special issue contains several selected papers presented on the symposium "GIS Ostrava 2019 – Smart City, Smart region" which was held on March 20–22, 2019 in Ostrava, Czechia.

Editors have no ambition to create a comprehensive view of all possibilities to use GIS for Smart cities and Smart regions but to exemplify some typical approaches (e.g. hydrological modelling for emergency management), new perspectives (e.g. coexistence of renewable power sources and classic power grids in a context of urbanization and deurbanization regional trends), and specific selected topics creating vibrant and colourful view to a common goal of building smart society.

The presented papers show a smart territorial management in a broader perspective giving a spectrum of various initiatives and applications where GIT can be found. Papers' topics range from typical regional building applications to specific technical issues (e.g., automatic labelling on maps); from the role of international collaboration for development of joint products and services to a standardization applied in smart city development (e.g., 3D cadastre, BIM); from key components of the smart region building (e.g., electricity supply) to leisure activities (e.g., mountaineering); and from strictly organised military services to voluntaries and crowdsourcing.

The first paper (Camargo et al. 2019) introduces the development of the region from the infrastructure requirements, renewable sources of energy and a projection of land use changes. Depopulation trends in rural part will have a negative impact on power grid density, to maintenance costs and to a growing role of self-sufficiency in such places. The new methodology enables detection of hot-spots of large changes in energy supply strategy.

International coordination in GIS and GIT is exemplified in the second paper on NATO approaches and solutions (Rada 2019) which are still rarely published. It may be interesting to look into the military kitchen to see how they solve multinationality problems to reach the same level, use standardized production (data, maps, etc.) and also the common GIS solution. These key elements enable to reach an effective collaboration which is essential to carry out military missions in any critical situation everywhere in the world but also to be ready for national emergency situations, e.g. large floods, industrial disasters or terrorist events.

The role of standardization is important both for international activities as well as for local plans. BIM is going to be a key progress in development of civil engineering sector but also related branches (engineering geology, urbanism, architecture etc.). However, BIM uses different concepts and models than GIS. It is necessary to seek appropriate transformations to integrate BIM, GIS, LOD and other international as well as industrial standards and fully utilize the advantages the collaboration of these sectors, assuring data interoperability, service interoperability and jointly build digital cities. Such perspectives are provided by the third paper in the issue (Janečka 2019).

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Still growing family of GIS applications offers also interesting systems for leisure time activities like mountaineering. The fourth paper (Nevistić & Špoljarić 2019) provides an overview of such applications. Crowdsourcing becomes one of the current trends in collecting and management of geographical data (VGI). Such initiatives enable to integrate knowledge and opinions of citizen in a new kind of applications.

Automation and artificial intelligence applications are essential tools for building smart regions and smart cities. Mapping and support for visualisation of built-up areas are touched in the fifth paper (Pokonieczny & Borkowska 2019) focused on automated labelling using artificial neural networks.

The traditional part of GIT applications is emergency management. It is necessary for development of smart cities and regions to become safe places, well prepared for emergency crises and hazards challenges of both natural and anthropogenic origins, and become resilient to different kind of hazards. A typical natural hazard in the Czech conditions is flooding. One of the contributions for improvement of emergency management is brought by the FLOREON project, monitoring and forecasting system built since 2006 in the Moravian-Silesian region. The last paper (Řehánek et al. 2019) is focused on improvement of the modelling results and predictions towards more precise and up-to-date spatial data sources, including modifications of methods for data preprocessing which enable to improve accuracy of the modelling results and also improve operational characteristics.

We believe each reader will find something interesting in the papers provided.

Guest editors

References

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Nevistić Z, Špoljarić D (2019) Web GIS in mountaineering in Croatia. Geoscape 13(2): 114−124 (this issue).

Pokonieczny K, Borkowska S (2019) Using artificial neural network for labelling polygon features in topographic maps. Geoscape 13(2): 125−131 (this issue).

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